

WHAT IS CLAIMED IS:

1. A servo motor control apparatus for electric injection molding machine, comprising:

a motion control unit, for generating a speed command;

5 a first drive amplifier connected to the motion control unit, for receiving the speed command of the motion control unit to drive a first servo motor, allowing the first drive amplifier, the motion control unit and the first servo motor to cooperatively form a first position control loop; and

at least one second drive amplifier connected to the motion control unit, for
10 receiving the speed command of the motion control unit to drive at least one second servo motor, allowing the second drive amplifier, the motion control unit and said second servo motor to cooperatively form a second position control loop; wherein the motion control unit comprises at least one synchronous controller for producing a speed feed forward compensation and a torque feed forward compensation obtained from a
15 difference between a position error of the first position control loop and a position error of the second position control loop, allowing the synchronous controller to use the speed feed forward compensation and a torque feed forward compensation to adjust the second servo motor and to keep the second servo motor synchronous in rotation speed with the first servo motor.

20 2. The servo motor control apparatus as claimed in claim 1, wherein the synchronous controller performs a filtering compensation calculation in terms of the difference between the position error of the first position control loop and the position error of the second position control loop, for producing the speed feed forward compensation of the second drive amplifier used for adjusting the rotation speed of the
25 second servo motor.

3. The servo motor control apparatus as claimed in claim 2, wherein the synchronous controller is managed to perform a differential calculation to the speed

feed forward compensation, for producing the torque feed forward compensation of the second drive amplifier used for adjusting a rotation angular position of the second servo motor.

4. The servo motor control apparatus as claimed in claim 1, wherein the
5 position error of the first position control loop is obtained by subtracting a position feedback value of the first position control loop from the position command generated by the motion control unit.

5. The servo motor control apparatus as claimed in claim 1, wherein the
10 position error of the second position control loop is obtained by subtracting a position feedback value of the second position control loop from the position command generated by the motion control unit.

6. The servo motor control apparatus as claimed in claim 1, wherein the position command generated by the motion control unit is a predetermined motion position arrangement of an injection screw of the electric injection molding machine.

15 7. The servo motor control apparatus as claimed in claim 1, wherein the first drive amplifier comprises a first speed controller, a first current controller and a first power amplifier, wherein, the first speed controller is connected to the motion control unit and the first power amplifier is connected to the first servo motor.

8. The servo motor control apparatus as claimed in claim 1, wherein the second
20 drive amplifier comprises a second speed controller, a second current controller and a second power amplifier, wherein the second speed controller is connected to the motion control unit and the second power amplifier is connected to the second servo motor.

9. The servo motor control apparatus as claimed in claim 1, wherein the first
25 position control loop comprises a first speed control loop, and the second position control loop comprises a second speed control loop.

10. The servo motor control apparatus as claimed in claim 9, wherein the first speed control loop comprises a first current control loop, and the second speed control loop comprises a second current control loop.

11. The servo motor control apparatus as claimed in claim 1, wherein the first
5 servo motor is used for driving a master drive ball screw of the electric injection molding machine and the second servo motor is used for driving a slave drive ball screw of the electric injection molding machine, so as to cooperatively drive the injection screw of the electric injection molding machine.